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A

TREATISE

ON THE

MONSOONS

IN

EAST INDIA.

By Capt. THOMAS FORREST.

CALCUTTA:

Printed by B. MESSINK.

M.DCC.LXXXII.

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MUSEUM

By Capt. Thomas Forrest.

CALCUTTA:
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M.DCC.LXXXII.

TO

LAWRENCE SULLIVAN, Esq;

CHAIRMAN OF THE COURT OF DIRECTORS

OF THE HON. EAST-INDIA COMPANY:

THIS

TREATISE ON THE *MONSOONS*,

IS INSCRIBED

BY

HIS OBLIGED, AND

MOST OBEDIENT

HUMBLE SERVANT,

THOS. FORREST.

CALCUTTA,
March 1782.

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CHAP.

INTRODUCTION.

NOtwithſtanding the remarks, rules, and obſervations, already publiſhed concerning the navigation from Europe, to and from India, alſo in India, which are to be found in the Old Eaſt-India Pilot, by Thornton; in D'Anville's Neptune Oriental; alſo, in Mr. Nicholſon's and Philo Nauticus's judicious remarks; it were to be wiſhed we had more obſervations upon the ſubject. It is only from experience ſuch obſervations can be made.—Above twenty years practice in what is called the country trade in India, during which time I made no leſs than fifteen voyages from Indoſtan to the eaſtward, enabling me to ſay a good deal upon the ſubject, is the reaſon of the preſent publication.

I find many good rules and obſervations in each of the authors already mentioned. The India Pilot errs in ſome things, tho' he is right in others. Philo Nauticus I had the pleaſure of knowing perſonally in India: he was a good merchant, and a ſkilful navigator. I ſhall, with great deference to him, and Mr. Nicholſon, repeat a good deal of what they ſay, and add illuſtrations of my own. I ſhall alſo retain what I find in the India Pilot, when it is conſonant to my own obſervation, and do him all the juſtice I can. His rules for ſailing to and from Batavia, are in the main good; but, his deſcription of Bencoolen, and the SW. coaſt of Sumatra, is unintelligible. And here I muſt obſerve, that, as I know little of the Perſian and Red-Sea gulfs in the weſt of India, never having been there, I cannot criticiſe on his account of them, nor of the parts adjacent; as my experience has been moſtly eaſt of Ceylon. His rules for ſailing along the coaſt of Coromandel and Ceylon, from accidents, ſuch as the cutting down of trees, pulling down pagodas, building of new ones, &c. local changes,

muſt

muſt make his land-marks of little uſe at preſent; but, when wrote, I dare ſay they were good.

You find, in the India Pilot, many valuable fragments not inſerted in later Directories, viz. Shark's Bay on the coaſt of New Holland; the dangerous Shoals of St. Brandon, near the French iſlands; Trinidada in the Atlantic, by the famous Halley, &c.

As I have, beſides the fifteen country voyages in India, made four voyages from Europe thither; I hope, what I preſume to ſay concerning the beſt track to keep both going and coming, will not be thought improper; although I am perſuaded there are many more valuable hints than any I can give, lockt up in journals * of the ſkilful commanders in the Eaſt-India ſervice, which not being collated together, nor properly digeſted and publiſhed, the world is ſo far kept from much valuable knowledge on this ſubject.

* From Mr. Dalrymple's aſſiduity in collating different journals, much good is to be expected.

Thornton, in the Eaſt-India Pilot, ſays, you ſhould, in croſſing the Line, or rather in going from the North Atlantic to the South, keep within certain limits; which he draws in the chart. I apprehend this is being too preciſe, and may be of loſs to an inexperienced navigator, who may think he does right, whilſt within certain rules, tho' baffled with calms, and unwholeſome rains. Thornton ſays very judiciouſly, "The NE. and SE. trade-winds "are ſubject to alteration; which variableneſs "is ſometimes found a degree or two ſooner "than the aforeſaid latitudes." (He might have ſaid, three or four degrees, inſtead of one or two.) "On the coaſt of Brazil, the winds "often blow eaſterly from September to March, "and to the northward of E. and from March "to September, it bloweth often between the "E. SE. and SSE." This perfectly agrees with the parallel I propoſe to draw between the theory of the monſoons in India, and in the Atlantic; for, in the Atlantic, monſoons prevail, though little adverted to, as ſhall be ſhewn in the following chapter.

A

TREATISE

ON THE

MONSOONS IN EAST INDIA.

CHAPTER I.

Of the Monſoons in general.

THE word *monſoon* comes from the Malay word *mooſſin*, which ſignifies ſeaſon. By many who knows little of the Malay tongue, the word *mooſſin* is underſtood to mean *year*. But this is a miſtake; for the word *town*, exactly as we pronounce

nounce it, ſignifies *year*, (mooſſin ſeaſon); and in the Malay idiom, they ſay *mooſſin baarat*, (weſt monſoon), and *mooſſin timore* (eaſt monſoon), in places where the different monſoons blow nearly in theſe directions, as at Batavia, Bencoolen, Malacca, and many other places. They alſo ſay at Paſſir, Sooloo, Balambangan, and many other places, where the gite or ſituation of the land or iſland favours the expreſſion, by cauſing the winds to blow accordingly, *mooſſin attarra* (north monſoon); *mooſſin ſalatan* (ſouth monſoon). I beg leave to call, in the courſe of theſe remarks, the well-known SW. monſoon, the *ſummer monſon*; and the well-known SW. monſoon the *winter monſoon*. I alſo beg leave to call the NW. monſoon (well known, but the advantage to be drawn from it little adverted to in India, and of which I ſhall have a great deal to ſay in the ſequel); I ſay, I beg leave to call it the *middle* or *croſs* monſoon. It prevails from the Line to 10 deg. S. latitude; whilſt the NE. monſoon blows to the northward of it, in the North Indian ſea, in the Bay of Bengal, and in the China ſeas. It

is

is particularly mentioned by Thornton; and extends from the iſlands Seychells, or Maka, as far E. as the coaſt of New Guinea, and, I believe, through Torres's Streights between New Guinea and New Holland, into the South Sea.

CHAP. II.

Of the cauſes of the Monſoons in India; their analogy to what we find in the Atlantic; and how they coincide with or oppoſe the Trade-winds.

THAT the diurnal motion of the ſun from E. to W. is the cauſe of the trade-winds all over the world, with certain exceptions; owing to the intervention of lands, mountains, &c. is a kind of ſelf-evident propoſition. Theſe winds go their continual round; nothing interrupts in the Atlantic and Pacific oceans; and in the Indian ocean, was the ſea as open in North as in South latitude, (I mean within the Tropics)

Tropics) the trade-wind would doubtleſs be found to prevail there alſo from the NE. all the year round, without any revolution from the SW. or, in other words, there would be no monſoons.

In the Pacific and Atlantic oceans, but more particularly in the latter, the motion of the ſun from North to South has certainly an effect upon the NE. and SE. trade-winds: but the Indian ocean, by which I mean the whole contained between the Cape of Good Hope, to the NE. then E. as far as the China ſeas, and then S. by New Holland, has no exit northward; and is open only by the Philippines and Moluccas into the South Sea.

This ocean being in a manner ſhut up to the North, is moſt obviouſly the cauſe of the returns of the clouds and vapours, that are drove thither in the ſummer monſoon; theſe vapours following, or being generated by the ſun's approach. So Iſlands, in hot countries, gather clouds on their hills towards noon, when the influence of the ſun is great, which are again diſcharged,

diſcharged, or ſent back towards the ſea, when the ſun is gone*.

Let us ſuppoſe that the continent of Europe extended from Portugal weſt to America; or, in other words, was the Atlantic ſhut up to the North, that ocean would be ſubject to a regular monſoon, as the Indian ſea is: And we mean to ſhow it is not entirely without ſomething which reſembles a periodical monſoon, ſituate as it is, open, for ought we know, to the North Pole.

The Eaſt promontory of South America, ſituated in a low latitude, projects a good way into the Atlantic. Here the currents ſet northward in the ſummer monſoon, and ſouthward in the winter monſoon †, following the ſun preciſely as they do in Eaſt India.

* And ſuch hills are generally clearly to be ſeen early of a morning, the clouds being then ſubſided.

† Vide Anſon's Voyage, and Cook's Voyage in 1775. In the Centurion, they had a continued help to the ſouthward in winter, along the Brazil coaſt.—This coincides with Thornton in the India Pilot, already quoted.

The body of water drove weſtward by the trade-wind at NE. in the North Atlantic, to the Weſt Indies, is ſtopt by the American continent, and finds an exit in the gulfs of Florida. This ſtrong current is well known; poſſibly the body of water drove by the SE. trade-wind in the South Atlantic, contributes its ſhare: But, from the gite of the Eaſt promontory of Brazil, and the trending of the coaſt thence to the W. of S. towards Cape Horn, there is the greateſt reaſon to think the current ſets ſouthward, almoſt perpetually, and eſpecially as the current on the oppoſite African ſhore ſets continually N. near the land, from the Cape of Good Hope northward.

Of the three great promontories in the ſouthern hemiſphere; Van Demen's in New Holland, Cape of Good Hope in Africa, and Cape Horn of America, that ſeem by their bleak, torn, and rocky fronts, to have withſtood the ſouthern ſtorms, (whilſt, poſſibly, many thouſand years ago, low and habitable lands contiguous to them, have been ſubmerged by the tempeſt) there are two remarkable phenomenon

peculiar

peculiar to the African and American capes, and of which there is not the leaſt doubt, as both are verified by experience: the current ſets almoſt continually to the eaſtward off Cape Horn, and to the weſtward off the Cape of Good Hope. How the current generally ſets off the ſouth promontory of New Holland, we cannot tell, having no experience; therefore, I ſay nothing about it. But I think it is reaſonable, that the almoſt perpetual weſterly winds off Cape Horn, cauſes the eaſterly current *; and the almoſt perpetual SE. trade-wind at the Cape of Good Hope, with the body of water drove weſtwards it, by the ſaid SE. trade-wind, in the Indian ocean, cauſes the weſterly current. Theſe well-known facts, I think, juſtify us by analogy to conclude, that

* Vide Anſon's Voyage, and the remarkable current on board the Lion of Cadiz, Captain Durloz Guyot, of St. Maloe's, publiſhed in Mr. Dalrymple's accounts of Halley's Voyage. They were ſet 10d. 36m. of long. to the eaſtward, in returning round Cape Horn from the Line, in 1756, and fell-in with a large iſland in lat. 54: 50 S. and long. 41: 32 W. of Paris.

the body of water drove before the SE. trade-wind in the South Atlantic, finds exit ſouthward near the forementioned Eaſt promontory of Brazil; as, in a parallel caſe, the ſame ſimilar direction or courſe of current, in the North Atlantic, finds exit through the gulf of Florida, which every body knows.

CHAP. III.

Of the Middle Croſs Winter Monſoon.

WE have already aſcribed the cauſe of the NE. monſoon to a kind of revolution in the atmoſphere from where the mountains of China and Tartary, of Tibet, of Pegu, Indoſtan, &c. being overcharged with vapours by the approach of the ſun in ſummer, now at his withdrawing ſouth in winter, diſcharge the accumulated load ſometimes from a north, ſometimes from a NE. direction, according to the gite or lying of the coaſts near which it blows.

blows. On the ſouth part of Sumatra it blows at NW.

The great body of water that begins to run in various directions, W. S. SSE. &c. according to the ſaid gite of lands and iſlands, comes like a torrent between China and the Philippines from the NW. part of the South Sea; for, here only, the Indian ocean is open to the North, as has been ſaid.

The current that, in November eſpecially, ſweeps round Ceylon to the Weſt, cannot ariſe from any great accumulation of water in the Bay of Bengal, as it is what the French call a *cul de ſac*, but is furniſhed from the Strait of Malacca; which current I have experienced to ſet ſtrong NW. and NNW. near Queda and Junk-Ceylon, for a little way into the Bay of Bengal, in November, from the ſaid Strait.

Here it is obvious the ſaid current, in the Malacca Strait, comes from the China ſeas; which alſo at this time ſets through the Banka Strait, towards the Sunda iſlands. It is obvious, alſo, that no great accumulation of waters can be gathered in the North Indian

ocean

ocean near Surat and Malabar, as there is no exit that way northward, it being alſo a *cul de ſac*; which brings me near Africa, where, from analogy, ſtrengthened by experience, I ſuſpect the middle or croſs monſoon to be generated.

The SW. monſoon, ſweeping down the gut of Madagaſcar in ſummer, without doubt, cauſes a great accumulation of vapour on the mountains of Africa. Theſe mountains near the cataracts of the Nile, collect the annual ſtock which fertilizes Egypt.

Was Africa * narrow from E. to W. to what it is; was the Mediterranean and the continent of Europe much leſs in length to what they are; theſe vapours ſo accumulated, might find exit to the W. or NW. into the Atlantic in winter, when the Sun goes South: but, it would ſeem, that the burning ſands of Africa drank up what part goes Weſt from the above-mentioned mountains. The greater proportion, I ſuſpect, goes Eaſtward, on the Indian ſide, and cauſes the middle monſoon in winter.

* Africa is above twenty times the area of the Indoſtan peninſula.

From

From this quantity of accumulated * vapour on Africa, I deduce the origin of the middle monſoon: True, it blows up the gut of Madagaſcar, as far as 20 deg. S. lat. at NE. The gite of the coaſt makes it follow this direction; but, further Eaſt a few degrees from the Line to 10 deg. S. it blows W. and NW. as by many years experience I have found, inſomuch, as to be induced to ſhape my courſe accordingly, and profit therefrom, and never was diſappointed in getting to my port with as much diſpatch as I could expect. I therefore think it is reaſonable, from the ſaid experience, to conclude, that the middle monſoon originates from the revolution of vapours accumulated in the Eaſt part of Africa, and that part of Arabia that lies between the Red-Sea and Perſian gulfs in ſummer.

* For land winds (to which I have already compared the winter monſoons) blows in all directions from where the vapours are moſt denſe; and on Sumatra, the land winds diſcharge themſelves from the mountains that lie longitudinally in general, part to the ſtrait of Malacca, and part to the SW. coaſt of the iſland.

Having

Having thus given my idea of its origin, the advantages to be deduced from it are obvious: for, if the navigator runs into the middle of its region, from 4 to 8 deg. S. he may make what Eafting he pleafes. And here I chufe to mention the currents found in the Lively brig, in 1781, in paffing the region of the middle monfoon, and, immediately after, the region of the NE. monfoons. The currents fet in oppofite directions; as witneſs the following inſtance in the Lively:

From February the 2d, lat. 8 S.; long. per acccount 74 : 9; per Time-keeper 74 : 3, until Feb. 17, (fifteen days) lat. 1 : 16 N.; long. per account 88 : 24; per Timekeeper 91 : 30--fet 3 : 6 E. of account. Winds moſtly WNW.

From February the 17th, lat. 1 : 16 N. until the 26th, (nine days) lat. 7 : 20 N. long. in 81 : 18 per account; per Timekeeper 81 : 42. Set 2 : 3 to the Weſtward of account. Winds moſtly NNE *.

* Thoſe who go the inner paſſage late in September, ſhould not quit the region of the middle monſoon, until they are as far E. as they wiſh.

The

The Elizabeth man of war left Diego Rais the 1ſt of December 1761, bound to Madras. She ſtood into 27 S. lat. which ſurely was unneceſſary. She got to Madras the 26th of January. In 1781, the Lively got from near Diego Rais to Anjengo in thirty-four days.

CHAP. IV.

Of the Croſs Summer Monſoon.

IN the preceding chapter, on the middle croſs winter monſoon, I have introduced terms, which I ſee in no book whatever on the ſubject. If I find, or pretend to find, a new road, I ſurely may be allowed to give that road a name. Without exact names or definitions in a treatiſe on ſuch a ſubject, it cannot be handled with perſpicuity. I ſhall therefore proceed to deſcribe what I mean, in as plain language as poſſible.

The NW. wind which blows from the Line to 8 or 10 deg. S. latitude in winter, blowing

in a direction acroſs the NE. monſoon, I have therefore called it the croſs monſoon; it being bounded to the South by the SE. trade-wind, makes me call it alſo the middle monſoon, it lying, as it were, incloſed between the NE. monſoon to the Northward, and the SE. trade-wind to the Southward.

But the SE. trade in ſummer, produced, or continued from where it blows perpetually, into a region to which it has not acceſs in winter, and ſo blowing in a direction that croſſes the SW. monſoon, it may with equal propriety as the other be called a croſs monſoon. This being allowed, the one may be called the croſs middle winter monſoon; the other may be called the croſs ſummer monſoon; the word *middle* not belonging to this laſt with propriety, as it is not incloſed on each ſide; or, in other words, it be ſaid, that, in winter, NE. NW. and SE. winds blow in their reſpective regions; and, in ſummer, the SW. and SE. only. In winter three different winds blow; in ſummer, only two.

CHAP. V.

Of the moſt eligible Track to keep from Europe to Eaſt India.

IF, therefore, a ſhip bound from Europe to India in winter, *i. e.* from the autumnal to the vernal Equinox, keeps a good offing, and does not come near Madeira, ſhe will have the advantage of not being ſo much in the region of calms, as if ſhe keeps further Eaſt; and will alſo be favoured with a current ſetting Southward.

There are alſo other reaſons why I would adviſe a ſhip bound to India to keep well to the Weſtward, even at all times.

It is obvious, that leaving the Channel with a NE. wind, and having got ſo far South as abreaſt of the coaſt of Portugal, if the ſhip do not keep well to the Weſtward, the high Pyrenean mountains, and others on the Weſt quarter of the continent of Europe, may, in

all likelihood, check a wind, which a hundred leagues further off, blows in force *.

Being further advanced, abreaſt the great continent of Africa, if the navigator does not keep well to the Weſtward, the retardment he will meet with may be more conſiderable: for, the continent of Africa being very broad, its middle part full of ſandy deſerts, may retard or ſtop the general Eaſterly wind in a very conſiderable degree. The Pyrenean mountains can only check, but the deſarts of Africa may extinguiſh the ſaid wind. And it is remarkable, that the region of calms, rains, and tornadoes, in the Atlantic, is oppoſite to the broadeſt part of Africa, being nearly in the ſame latitude: And this is not to be wondered at, when we conſider that Africa is the broadeſt piece of land upon the globe that paſſes under the Equator. No

* So ſhips bound from the low latitudes of America to croſs the Pacific to India, are often baffled for weeks together, and even at a good diſtance from the land; which certainly is owing to the interruption the mountains left behind give to the wind. Farther on, fairly in the South Sea, this ſeldom or never happens.

wonder,

wonder, then, if the wind that blows from the Indian ſide, is cooled, and almoſt extinguiſhed, in paſſing over that vaſt heated peninſula.

And although, in the ſummer monſoon, the winds off the Eaſt promontary of Brazil, may be SSE. to S. and SSW; yet, from an apprehenſion that ſuch are foul winds to get on with into a high South latitude, I would by no means have the navigator be againſt ſtretching that way, as he will thereby eſcape the calms that prevail further Eaſt near Africa; and, ſhould the wind come ſo far to the Weſtward as SSW. a good ſtretch may be made SE. to where, more in the middle of the South Atlantic, the SE. trade may be expected. At the ſame time, I would not adviſe to make ſo free with the coaſt of Brazil, during the ſummer monſoon, as during its oppoſite; for, then, the current off the Eaſt promontory of Brazil, aſſuredly ſets to the Southward; but, I ſuſpect, it ſets ſo all the year round, for reaſons given in Chap. II.

Having got into the South Atlantic, I would have the navigator pay more regard to getting South than Eaſt; that is, to ſteer rather SSE.

than

than SE. ſuppoſing the wind enables him to do either. I know, to this advice, it will be objected, Why not ſteer SE. rather than SSE. it cuts off ſo much diſtance? I ſee the force of this objection; but, let the navigator reflect, that this fair wind, on which there can be no dependence for continuing, in ſteering SE. and by which, it would ſeem, he coveted Eaſting as well as Southing at the ſame time, may leave him in the lurch, by the expiration of the favourable ſpirt, in a parallel, far ſhort of where he might have got, had the getting Southing at this time been his principal object, letting the Eaſting come in only as a collateral or ſecondary conſideration.

Having got well to the Southwatd, I would by no means adviſe coming near the Cape of Good Hope, if the navigator intends going without Madagaſcar, but to keep in 39 or 40 deg. latitude. The variation of the compaſs determines the longitude nearly; and it is not unadviſeable to make Gough's iſland, whence, who knows, but refreſhments may be had.--- In this high parallel the winds are more ſteady,

and

and the currents ſetting Weſt near Africa are avoided.

If bound without Madagaſcar, I would now adviſe the navigator to pay his chief regard to getting Eaſtward, and not covet Northing too ſoon; never keep his ſhip right before the wind, (unleſs, indeed, ſhe ſails beſt that way); to remember that ESE. and ENE. courſes, combined, differ not from Eaſt. And here I would have him ſtudy the caſe of the ſhip, and her maſts, in the courſe he ſhapes; always giving his officers a latitude of altering the courſe two or three points ſo far, as ſo doing, makes the ſhip eaſier, or enables her to go faſter; and by no means to confine his courſe to a certain point, as if deviating therefrom could be of any bad conſequence here in the wide ocean.

From the longitude of 10 deg. E. to beyond the meridian of the iſland of Madagaſcar, the wind will frequently veer from W. to SW. S. SSE. and SE. and in the courſe of forty-eight hours, or three days, comes round to the Weſtern quarter again. When this happens, let him keep his ſails rap full, and rely chiefly on his

variation

variation for making Ceylon, or the Strait of Sunda. But, during the middle or NE. monſoon, if bound for the Strait of Sunda, let him fall-in with Engan's, or the coaſt of Sumatra, South of Bencoolen. If during the SW. monſoon, but eſpecially in May, June, and July, he is bound for the Strait of Sunda, let him fall-in with the coaſt of Java, as SE. winds prevail there in general, during theſe months; at the ſame attended with revolutions from the oppoſite quarter; remembering, that the current generated by the wind at NW. on the N. end of Sumatra, in ſummer, though it * drains in-ſhore along the South part of that iſland, the draining Eaſtward goes not beyond the Strait of Sunda, to the coaſt of Java; it being already exhauſted on the coaſt of Sumatra.

* This circumſtance of the draining of a current againſt the expected SE. wind, makes it not ſo hazardous to fall-in, in ſummer, to the weſt of the Strait of Sunda; tho' the Surat Dutch ſhip has often been baffled there. But if, during the middle or winter monſoon, he makes the land E. of the Strait of Sunda, he muſt run back into the SE. trade to get weſting, unleſs he boldly keeps near the coaſt of Java for land and ſea winds; for here the current ſets ſtrong Eaſt during the middle monſoon.

CHAP.

CHAP. VI.

Of the Monſoons on the SW. Coaſt of the Iſland Sumatra.

THE iſland Sumatra being biſected by the Line, cauſes a ſingular phenomenon, which ought duly to be attended to by thoſe who have occaſion to ſail that way. The many voyages I have made upon that coaſt, enables me to ſay ſomething that may be depended on; and, I muſt acknowledge, that I ſailed upon it ſeveral years before I knew the theory or nature of the monſoons there. I attributed circumſtances to the whole coaſt of winds and weather, which only belong to half the coaſt at a time. Experience convinced me I reaſoned wrong; and I have ſince found, that whilſt the North half of the coaſt from Acheen Head to the Equator, is in the region of the NE. monſoon, the other South half, from the Line to the Strait of Sunda, is in the region of the Middle Monſoon, (mentioned in Chap. III.) which, as has been ſaid, blows only during the

Winter or NE. Monſoon, from the Line to 10 deg. S. latitude.

The SW. coaſt of the North part of the iſland Sumatra, during the NE. monſoon, is affected by it, exactly as the Malabar coaſt is affected during the ſaid monſoon; that is to ſay, they have then the fineſt of weather, with land and ſea breezes: For, the NE. monſoon that blows in full force behind this half of the iſland in the Strait of Malacca, is checked almoſt entirely by the high mountains; inſomuch, that it does not gather force again, till at a great diſtance. South of the Line, the Middle Monſoon checks it entirely, and in a manner extinguiſhes it.

Fix the point of a compaſs half way between Acheen Head and 1 deg. N. lat. on this part of the iſland Sumatra, and, with it, deſcribe a ſemicircle to the SW; within this ſemicircle is the region of calms during the NE. monſoon: Therefore, if the navigator values his time, let him keep clear of it. If near it, and Weſt of the meridian of Acheen Head at the ſame time, he will find a drain of a current ſetting to the

weſtward,

weſtward, that comes from the Strait of Malacca.

During the Summer monſoon, the SW. winds that blow in the Bay of Bengal, meeting here the high mountains, are checked, and blow down this coaſt from the NW. They bring rain and bad weather as far as the Line; where, for a ſmall ſpace, variable winds prevail at all times of the year. Thus the gite, or ſituation of the coaſt from NW. to SE. changes the line of the wind's primitive direction; a current ſetting to leeward accompanies it, being part of that great body of water that comes during this monſoon, from the Strait of Madagaſcar near paſt Ceylon, into the Strait of Malacca; for, at Acheen Head, it ſeparates; part going into the Strait, and part down the coaſt of Sumatra.

I have already ſaid, that this coaſt of the North part of the iſland Sumatra, reſembles the coaſt of Malabar in the Winter NE. monſoon: but there is one circumſtance in which it is eſſentially different, and of which the navigator ſhould take particular notice: The

NE. monſoon, in the China ſeas, is checked by the peninſula of Malacca, but recovers itſelf in the Bay of Bengal. It is again checked by the mountains of Indoſtan, but recovers itſelf in the northern Indian ocean off the coaſt of Malabar, where, it being laſtly checked by Africa, it blows far up the gut of Madagaſcar *. But the ſaid monſoon being checked by the mountains on the North part of Sumatra, it recovers itſelf but faintly; being loſt, as I apprehend, in the Middle monſoon, near the region of which it comes; and this, no doubt, cauſes the calms within the ſemicircle before mentioned.

On the other hand, calms need not be expected within the above-mentioned ſemicircle, during the SW. monſoon. Freſh gales prevail there; and, if a ſhip is bound from Indoſtan to Batavia, let her faſten as ſoon as ſhe can on the coaſt of Sumatra in South latitude, but not

* The NE. monſoon left the Elizabeth man of war in 21 S. lat. and 2 : 11 long. from Moſambique, on the 31ſt of January 1764, as has been before hinted.

North

North of Indrapore Point, where, with land and ſea breezes, ſhe may get to the Strait of Sunda, againſt the SE. winds, that prevail on this part of the coaſt during the SW. monſoon, and about which I ſhall now ſpake more particularly.

Whilſt the North part of the coaſt enjoys fine weather during the NE. monſoon, the ſouth part of the coaſt is in the region of the middle or NW. monſoon with freſh gales and rain, *vice verſa* in ſummer; that is, during the SW. monſoon, on the South part, the wind coincides with the general SE. Trade, and brings fair weather.

At this time, Dutch ſhips from Surat that go to Batavia, after quickly getting down the coaſt of Malabar, round Ceylon, are, when they come near the South part of Sumatra, much retarded with SE. winds. I have known theſe ſhips often put back from near the Strait of Sunda to Bencoolen, with a ſickly crew;---ſail thence, and put back again; making a paſſage of three or four months from Surat to

Batavia.

Batavia *. And this makes me wonder that the annual Surat Dutch ſhip does not leave Surat in the month of January or February; run into 6 or 7 degrees of S. latitude; where, with the middle monſoon at W. and NW. ſhe could quickly get to the Strait of Sunda.

* Was the ſhip to faſten on the coaſt of Sumatra, near Indrapore Point, or South of it, the current generated by the NW. wind on the North part of the iſland, as already hinted at, drains down the SE. part of the iſland, cloſe in-ſhore, even againſt the SW. wind, of which advantage is to be made. But large ſhips are afraid of keeping near the land. The current, all the year round, ſets the whole length of the coaſt, more to the Southward than Northward.

CHAP.

CHAP. VII.

Of the proper Track to keep in going from Madras or Bengal, to Bencoolen, Batavia, or Parts further Eaſt, during the Winter NE. Monſoon.

I HAVE been going from Madras to Bencoolen during the NE. monſoon, and, by ſteering SE. the neareſt track, have had a tedious paſſage. About the meridian of Acheen, and a degree to its ſouthward, had the wind at SE. blowing freſh for ſeveral days. This was certainly a very irregular wind at this ſeaſon. I was alſo once going a freighter in the Europe ſhip Denham, from Bengal to Bencoolen, the latter end of winter (February), and by not keeping the Bay open, but coaſting Sumatra, without the iſlands Virkins, Nantian, Nays, Fortune, and the Naſſau iſlands, we had a tedious paſſage to Bencoolen, as we went within that ſemicircle, recommended in a former chapter to be avoided.

The

The beſt track is to keep the Bay open; or, in other words, keep near the meridian of Point Palmiras, ſteering South, until in 5 or 6 degrees South latitude, where the middle monſoon at W. and NW. may be expected. This coincides with the track kept by ſhips going to China, by Captain Wilſon's (Pitto Strait) paſſage.

The ſame track is recommended, if bound from Bengal to places Eaſtward in South latitude: but, if bound to Acheen, or the North part of Sumatra, let the navigator keep well to windward of Acheen Head, and go through the Surat paſſage, if bound to Nalabow, or elſewhere down the coaſt of Sumatra.

CHAP.

CHAP. VIII.

Of the beſt Track to keep from Madras, or Bengal, to Bencoolen, during the SW. Monſoon.

IN the month of Auguſt, a ſhip may get from Bengal to the Southward, by keeping cloſe to the coaſt of Coromandel, for then the freſhes of the Ganges ſet along-ſhore. Having got a little way down, as far, perhaps, as Point Godewar, ſhe may put of, when the wind hangs well to the Weſtward, and get Southing and Eaſting together. But, ſhould the navigator fall to leeward of Acheed Head, (for in Acheen road the wind blows thro' the Surat paſſage at SW. into the Strait of Malacca) let him anchor, the nearer the ſhore the better; and, by land and ſea breezes, he may eaſily get to Acheen road, where, in ſmooth water, he may anchor and refreſh.

Departing from Acheen, the track is down the coaſt of Sumatra, leaving what is called Paſſage Iſland, on the right hand; off the NW.

end of which is a reef, which it would be proper to ſend a boat to reconnoitre, and lie upon, until the ſhip is paſt. Thence ſteer for Pulo Mazular, on the NW. end of which is a remarkable water-fall. In the French and Engliſh maps of this part of the coaſt, both copied from the Dutch (I believe), a line or track is drawn, and depth of water is ſignified cloſe by that line. The ſhip Experiment was loſt on Bird Iſland, two miles North of Pulo Lucotta, in 1772, by keeping in 28 or 30 fathom water. I have been on this very ſmall iſland three or four times, in paſſing this way, to get birds and eggs: it is not in magnitude above half an acre, with graſs upon it. Off its North end, is a reef extending near a mile, where the ſhip was loſt, owing, chiefly, to the falſe ſoundings laid down in the chart: therefore, I requeſt the reader will take particular notice of what I am going to ſay on that ſubject.

I have paſſed this iſland at leaſt ten or twelve times, and have been on it three or four times. In 1756 there was no graſs upon it. In 1765, there was graſs on it. I have paſſed it in the night,

night, without ſeeing it, ſteering by ſoundings, in 17 and 18 fathoms muddy ground; alſo in the day, and almoſt (as near as I can recollect) in that mid-channel line laid down in the printed charts, and where 17, 18, and not above 20 fathoms, ſhould have been wrote; inſtead of which, 30 and 32 being wrote, the navigator naturally thinks, whilſt in that depth, he is in that line. But I aſſert, that ſuch a depth will carry him (if not upon) very near the iſland; which, tho' bold to the North within piſtol-ſhot, is foul to the Weſt. It is pity but the copper-plate was altered, by erazing from the track 30 and 32, and engraving thereon 17 or 18 fathoms, for at leaſt four or five miles.

Beſides the reef of this Bird Iſland, there are ſome very dangerous ſpots of corral rocks, under water, to the Eaſtward of it, which I have ſeen as I paſſed. In ſhort, ſailing from Paſſage Iſland, until paſt Mazular, I would adviſe not to ſail in the night; except, within and near Mazular, I always paſſed within it. Having paſſed Mazular, ſteer for Pulo Battoo, called by the Malays called Pingee; off the North

end of which are three iſlands: Give them a reaſonable birth, and ſteer on, within the large iſlands, but without the ſmall iſlands.

If, further down the coaſt, near Indrapore Point, you meet SE. winds, the ſhip muſt anchor, and, with land and ſea breezes, work down the coaſt, obſerving what is ſaid in the Directory about the ſhoals off Ipos, and other places North of Bencoolen.

Hitherto, I have ſuppoſed the ſhip to paſs within Pulo Virkins, and what is called Pulo Banjack, or Pulo Bania. Pulo Bania (many iſlands) is the proper name. On the largeſt of this laſt cluſter, which lies SE. of Verkins, is a remarkable hill, making, in ſome directions, like a ſugar-loaf. If you go by Paſſage Iſland, this hill muſt be left on the right hand; but there is paſſage without it, *i. e.* between it and Pulo Nays. Keep neareſt Pulo Bania, and anchor in the night; for there are ſome ſhoals, and ſmall iſlands, no where laid down; therefore paſs them by day-light.

Further, by avoiding both theſe ſtraits, you may keep at ſea, and paſs between Nays and

Nantian,

Nantian, where is a bold paſſage; or even as far as Naſſau, or the Poggy iſlands, where, ſailing cloſe to the N. Naſſau iſland, is a good paſſage, leaving it on the right; but, ſo far to the Southward during the SW. monſoon, SE. winds may be met with: therefore you muſt get in-ſhore, and anchor cloſe to the main land, and truſt to land and ſea breezes, as before directed, being now abſolutely in the region of the SE. monſoon; obſerving, if you have rain on the ſprings, it generally brings the wind from the Weſtward, as SE. winds bring fair weather.

CHAP. IX.

Of the beſt Track to keep from Indoſtan to Celebes, or the Moluccas, during the SW. Monſoon.

SAILING from Indoſtan ſo far Eaſt, and in South latitude, it is obvious that the navigator will meet the wind at SE. Eaſt of the

the meridian of the Strait of Sunda, and even before. He is ſure of it in May, June, and July; but there are often ſpirts of Weſterly wind, from which he may profit. The beſt rule, I think, is to get with the Weſterly winds in North latitude, as far Eaſt as he can; then, when the wind comes SE. ſtand South. Near about the Tropic he may find the wind South, S by E. nay S by W. with which he may put about, fetching well to windward, according to where he is bound: If bound to Gilolo, he muſt ſtand far South, and make New Holland; on the Weſt coaſt of which, I ſuſpect, the wind is in this monſoon at South, correſponding to what it is on the oppoſite ſide of India, on the coaſt of Africa. But, aſſuredly, when he comes to that part of the coaſt of New Holland where the land trends ſuddenly Eaſtward, in ſummer, he will have the wind at Eaſt.

If bound to the North coaſt of Celebes, the ſhip may go the uſual track between Balambangan and Borneo; then, having worked down the NE. coaſt of Borneo, according to inſtructions printed in a Voyage to New Guinea, ſhe

may

may fetch the North coaſt of Celebes; remembring that, in this monſoon, the wind is freſh at South up the channel between Borneo and Celebes.

CHAP. X.

Of ſailing from Indoſtan to Magindano, (or Mindano) at all Times of the Year.

IN the SW. monſoon, *i. e.* from May to October, a ſhip may get there in the uſual track, through the Strait of Malacca, in about five or ſix weeks, paſſing cloſe to the North part of Balambangan, and to the South of Baſilan: ſhe might afterwards proceed to China as late as October, by the Eaſt of Mindano; nay even later: until December ſhe has China, as it were, under her lee; becauſe ſhe can get into the South Sea far nearer to China than the Pitt's Strait. I may venture to ſay, a good ſhip may get from Mindano to China, at any time of the year, and *vice verſa*. She may alſo

alſo return from Mindano to Madras at any time.

If during the SW. monſoon, from May to October, ſhe muſt ſtand over to the Weſt coaſt of Celebes, where, with land and ſea breezes, ſhe gets to the Southward, ſo as to be able to weather Pulo-Laut on the SE. part of Borneo. Care muſt be taken to keep cloſe to Celebes; becauſe, on the oppoſite ſhore of Borneo, the winds are at South. Having paſſed Pulo-Laut, the wind is fair at SE. to run within Java through the Strait of Sunda into the SE. Trade, in 8 or 9 S. latitude; and the ſhip ought to endeavour, before ſhe ſtands to make Ceylon, to be full as far Weſt as the meridian of the Weſt part of it. A North courſe may then only make the Eaſt part of it, the current ſets ſo ſtrong Eaſt, when the ſhip comes near the mouth of the Bay of Bengal.

I have ſaid the navigator muſt, from Mindano, ſhape his courſe between Celebes and Borneo. This is recommended, becauſe the Weſt coaſt of Celebes is high, and he is ſure, by ſea and land winds near it, to get forward.

If

If he went between Celebes and Gilolo, poſſibly he could not get forward at all; as I ſuſpect (though I cannot certainly ſay) that a Southerly wind blows throughout theſe Straits, during that monſoon, from ſide to ſide; which is not the caſe in the other channel between Celebes and Borneo. Prows go continually from Paſſir to Batavia, and elſewhere, by ſtanding over to Celebes, to the Northward of the Little Pater-noſters, and ſo weather Pulo-Saut, where, in the SW. monſoon, the wind is SE.

To ſail from Mindano to New Guinea during the SW. monſoon, the navigator muſt ſail into the South-Sea, as far as the meridian of the part he wants to viſit, and then ſteer South, endeavouring to fall-in to the Eaſtward of his port, as the current ſets Weſt on this coaſt during that monſoon, and the wind is at SE.

In ſhort, Mindano is ſo centrically placed, that I ſee no difficulty of ſailing to and from thence at all times to any part of India, by obſerving this general rule: that during the SW. monſoon, from May to September, the winds in India, Eaſt of Ceylon, are SE. in South la-

titude; and, during the NE. monſoon, that is, from November to May, the winds are NW. in South latitude; I mean, from the line to 9 or 10 degrees.

This being adverted to, which is really the caſe, it is obvious, that a ſhip may get from Madras, Bengal, or Bombay, to Mindano at any time; if during the SW. Monſoon, the courſe is well known to be through the Strait of Malacca, as has been ſaid; if during the NE. monſoon, from November to May, ſhe muſt run Eaſt in 5 or 6 S. latitude, and might venture, having paſſed Salayer, in the track to Pitt's Strait, to ſtand North between Celebes and Gilolo; but, if between theſe iſlands ſhe finds a Northerly wind, which is likely, I would rather adviſe to ſtand Eaſt directly thro' the Strait of Auguſta, Pitt, or Golowa, into the South-Sea, preferring the Southern Strait. Being then in the South-Sea, the ſhip muſt ſteer North, as if going to China, and make St. Auguſtine, the SE. point of Mindano.

This paſſage is againſt the monſoon, but may be made in ſeven or eight weeks from Madras

to

to Mindano; whereas, with the monſoon, it may be made in five or ſix weeks.

From what has been ſaid, it is obvious, that a ſhip may ſail from Madras to Mindano in five or ſix weeks, and return directly in ſeven or eight, during the SW. monſoon, and *vice verſa*. She may ſail during the NE. monſoon to Mindano in ſeven or eight weeks, and return to Madras in five or ſix: In the firſt caſe, ſhe ſails with, and returns againſt; in the ſecond caſe, ſhe ſails againſt, and returns with the monſoon.

CHAP. XI.

Of the outer Paſſage to Bombay; of croſs Winds in the Bay of Bengal; Currents in the China Seas; South Coaſt of Africa; Paſſage Home.

THE advantages of getting to the Eaſtward in Winter, by running from Indoſtan into the Croſs (Winter) or Middle monſoon, have been ſufficiently illuſtrated. The getting to the Weſtward againſt the SW. monſoon,

may

may alſo be effected by a ſimilar manœuvre, viz. running into the SE. Trade: this is called the outer paſſage to Bombay and the Gulps, now well known, and firſt, I believe, attempted and executed by that able ſeaman and navigator Sir William James, in the Protecteur, about the year 1756. The general rule is, to avoid the Baſſes de Chagos, by ſteering in a certain parallel. A kind of croſs wind blows alſo in the Bay of Bengal during February, March, and April. Whilſt in the middle of the Bay, it blows NE.; along the coaſt of Coromandel, it blows from the Southward, well known by the name of the Long-ſhore winds; notwithſtanding the wind blows often at NE. in February on the coaſt of Coromandel, and ſometimes in March, for a few days. Whilſt the Long-ſhore winds blow, it is impoſſible to get againſt them to the Southward without leaving the land; but when in May land-winds begin to blow, it is eaſy to get to the Southward. At the beginning of the NE. monſoon, the current ſets ſtrong to the Southward in the China Seas; and at Pyrate's Point, the North

cape

cape of Borneo, it divides, paſſing both the Weſt and the NE. coaſt of that iſland, until late in January. The current then ſets Weſt, through the ſtrait between Borneo and the iſlands Balambangan and Banguey.

I ſhall ſay little about the paſſage home from India; it is a kind of beaten track. Many commanders in the ſervice can treat the ſubject better than I: But, in getting along the SE. coaſt of Africa, I am an advocate for keeping near the ſhore, to profit from the windward current; and there the winds never blow right on the ſhore, which lies nearly Eaſt and Weſt: I have therefore called that quarter the South coaſt of Africa. The idea of a cape, which oftener makes an acute than an obtuſe angle, may have led geographers to make the famous Cape of Good Hope an acute angle; whereas it is nearly a right angle, the coaſt trending almoſt due Eaſt a great way. Being paſt it, I am for avoiding Africa for the ſame reaſon as when outward bound; but ſhips are ſeldom ſo much becalmed homeward, as when leaving England.

CHAP. XII.

Deſcription of the Iſland of Trinidado.

PETER MATHIAS JOELE, commander of the Nord Nienco Landt, a ſhip of ſixty-four guns, belonging to the Dutch Eaſt-India Company, put in at Trinidado in April 1760. They hove down the ſhip, and cut a main-maſt in the woods: in fourteen days they left the iſland.

The Portugueze are in poſſeſſion of the iſland, and, to a man, have been baniſhed from the Brazils, a prieſt or two only excepted; and theſe are not to be truſted in any inſtance whatever.

When he hove his ſhip down, he was obliged to keep a conſtant guard. He got bullocks of a middling ſize for ſix dollars a head. They got poultry in great plenty, and Indian corn, but no other grain. Coarſe check ſhirts, and coarſe broad brim'd hats, anſwered much better than money.

Direc-

Directions for the Harbour.

When the rocks of Martin Vaz (which lie E by S. Southerly from Trinidado 7 leagues) bear ESE. and the Eaſt parts of Trinidado NE by E. the bay begins to open, wherein, at the upper end, you will ſee a hill like a ſugar loaf. A mile from the ſhore you have ſoundings 45 fathoms, coarſe ſand. In the mouth of the bay you have 35 fath.; and by the time you have got this length, or ſoon after, you will perceive three bays; one right a-head, called the Northermoſt or middle bay; and one on either hand, called the Eaſtermoſt and Weſtermoſt bays. The Eaſtermoſt is the beſt of the three; the Weſtermoſt is full of rocks; and the Northermoſt, having ſhoal water, is alſo open to the ſea.

The Eaſtermoſt bay is to be diſtinguiſhed by a church with a large croſs upon it, which ſtands at the upper end. You may come to anchor in 6 fath. water, the aforeſaid church bearing WSW; and thus ſituated, you may

moor

moor your ſhip with a cable on ſhore; a point like the South foreland bearing SW by W. The watering place is near the church; and you may lay your long-boat under it, and fill the caſks by means of a hoſe.

This iſland lies in the direct track of India ſhips outward bound. They always endeavour to go to the Eaſtward of it; but if the SE. Trade-wind is not favourable, they either fall in with it, or go to the Weſtward of it.

I was favoured with the above account from Mr. Kidd.

CON-

CONCLUSION.

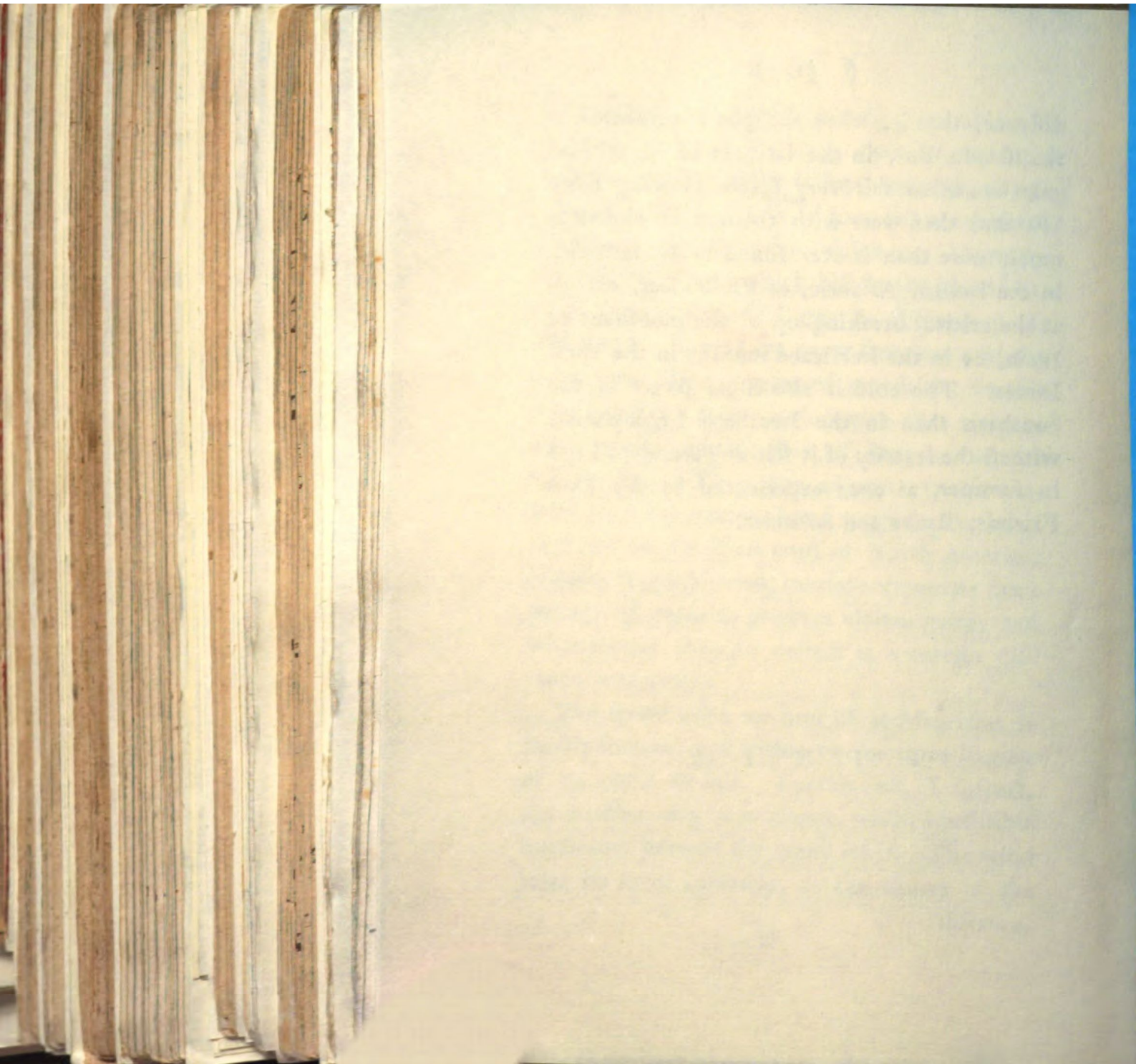
HAVING, in the preceding pages, gone through what I undertook, *A Treatiſe on the Monſoons in India*, I beg leave to make a few deſultory remarks.

What I have ſaid, has ſprung from a long practice, on which I have formed a kind of theory. The theory goes hand-in-hand with the preceding practice; and, in many places, I frankly acknowledge my errors, particularly about the SW. coaſt of the iſland Sumatra, where I have often been. Latterly, I found circumſtances of wind and weather peculiar only to half the coaſt at a time, which I, in the days of my ignorance, attributed to the whole length of that SW. coaſt. I never knew a ſevere gale of wind on that coaſt. It often blows from the NW. a cloſe-reefed topſail gale; ſeldom above that, unleſs, perhaps, where a land-wind comes off at North, it may, for a few minutes, oblige a ſhip to edge away with

the main-ſail up, which is a far preferable manœuvre, if there is room, than to clew up a topſail, and by letting it flap, endanger its exiſtence. Theſe ſquals ſeldom laſt above ſeven or eight minutes with violence. Here the Equinoctial Line, which biſects the iſland, acts like a temperator, if I may be allowed to uſe the word. Storms are never frequent near the Line; and the changing of monſoons, on this coaſt, is never accompanied with that violence that we find in the Bay of Bengal, and the China ſeas. There the adjacent continents, with high mountains, breed tempeſts like what is found on the Weſt coaſt of North America. Iſlands, it would ſeem, cannot accumulate ſtock enough of vapor to produce violent gales; and what matter they do collect at a certain diſtance, evaporates.

The ſevere gales we hear of at Mauritius is moſtly internal, and within two or three leagues of its outer circuit. Further off, I ſuſpect, the weather may be moderate, whilſt irreſiſtible hurricanes pervade the iſland itſelf. The wind loſes its force inverſely, as the ſquare of the

diſtance,

diſtance, that is, when the gale is generated in the iſland: But, in the latitude of Mauritius, gales are often felt very ſevere blowing from SE. and then veer with the utmoſt violence, much more than is ever found in N. latitude, in the Indian, Atlantic, or Pacific ſeas, except at the critical breaking-up of the monſoons in India, or in the hurricane months in the Weſt Indies. The cold is alſo more ſevere in the Southern than in the Northern hemiſphere; witneſs the ſeverity of it felt at Terra del Fuego in ſummer, as once experienced by the Two Friends, Banks and Solander.

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